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ABSTRACT

This report discusses some of the characteristics and benefits of an interdisciplinary curriculum, as well as practical considerations involving the introduction of such a curriculum in elementary and secondary schools. To successfully introduce an interdisciplinary curriculum, teachers and administrators need to: (1) integrate the curriculum; (2) incorporate subject areas; (3) select topics and themes; (4) adapt teaching practices; (5) schedule theme studies; (6) assess student learning; (7) involve parents and the community; and (8) deal with the inevitable conflicts and difficulties that arise. Seven examples of interdisciplinary curricula in schools and school districts across the country are profiled. Each example includes a brief description of the development of the curriculum, and the name, address, and telephone number of a contact person for the school or school district. (MDM)

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CURRICULUM REPORT
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Interweaving the Threads of Learning: Interdisciplinary Curriculum and Teaching

Helping students see connections across content areas requires flexibility and teamwork from teachers. Schools using this approach, however, report favorable results.

Interdisciplinary curriculum has several different meanings. The broad fields concept in the social studies or language arts attempts to build curriculum with related subject matter content. In some cases, those interrelationships are defined in terms of skills.

In the language arts, reading, spelling, and writing skills are taught as aspects of the larger study of language and literature. In the social studies, historical subjects such as the American Revolution are related to geographical and sociological factors.

By comparison, a more integrated curriculum connects two or more subjects that are not subsumed in the broad fields concept.

The fields of science and social studies may be combined to study a topic like water, for instance, as it pertains to the settlement and development of a geographic area and the issues of the hydrologic cycle, the geological factors affecting water collection in aquifers and reservoirs, and the technology of water reclamation and reuse.

More ambitious programs will add to that science-social studies connection statistical analyses of rainfall, population densities, and water usage needs of a community. Even more ambitious programs might explore the concept of water in poetry, water issues in several forms of literature, and the ways water is depicted through the visual and performing arts.

As several fields of study are woven through interdisciplinary topics, the curriculum becomes more clearly integrated. When the topic develops into a concept that has universal meaning and significance for each of the separate fields of study, the integrated curriculum becomes thematic.

The characteristics of theme studies clearly distinguish them from other forms of interdisciplinary curriculum:

1. They are broad, with many subtopics, and are dedicated to developing students' critical and creative thinking and ways of knowing that are significant for learning in all the traditional disciplines.
2. They represent the content and process of what students are expected to learn in school; they are not "add-ons" or "special events" in the curriculum.
3. During their development, they often are the most important study focus of students and teachers.
4. They incorporate many traditional subject areas in ways that maintain the integrity of each discipline.
5. Each is developed over an extended period of time through the study of many subtopics within the theme.
6. Inquiry is at the heart of each theme: studies are question-driven and students are involved in searching for their answers, often using primary sources.
7. The entire community becomes the learning laboratory for theme studies, providing diverse resources for exploring questions derived from the theme.
8. They offer learning opportunities for students at different developmental levels and with varying abilities.
9. They encourage differentiated and diversified learning activities and assignments.
10. The evaluation of student growth is ongoing and formative, and uses alternative methods of teacher assessment and learner self-assessment.

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While this concept of curriculum and teaching is not easy to superimpose on the existing school structure, it can be done in stages and to degrees that are comfortable for any school community.

The ways of thinking that advance knowledge in any field of study are the same as those that advance learning in each individual:

- Attending to details
- Thinking fluently and flexibly
- Formulating questions
- Simplifying questions and problems
- Searching for patterns
- Forming hunches and hypotheses
- Testing/experimenting
- Thinking visually
- Interpreting/analyzing
- Thinking intuitively
- Finding elegant solutions
- Using models and metaphors
- Taking risks
- Cooperating/collaborating
- Competing
- Persevering.

When students are encouraged to explore a topic in interdisciplinary ways, they see interactions among the fields of study. They also become aware of multidimensional ways of perceiving any person, place, object, or event.

AMERICA 2000: An Education Strategy (1991) is a crusade to redesign schooling and reconceptualize education. One strategy is to develop a nation of life-long learners.

Developing this "Nation of Students" is a particularly ambitious goal because it emphasizes a concept of curriculum and teaching in which "big" ideas rather than a collection of facts become the organizing themes for curriculum design and development. The education of life-long learners places highest priority on developing student thinking, especially the ability to press against the frontiers of their own knowledge.

Such studies, with questions formulated from the perspectives of several different fields of study, encourage students to think in similar ways about different subjects. Interdisciplinary studies guide students to use those common processes within and across the relevant subject areas, ensuring a more thorough study of thematic concepts and generalizations. Most important, they develop students' abilities to inquire.

Interdisciplinary education in middle level and secondary school requires an organization that encourages teachers to team up so they will view their students' capabilities and needs from the several perspectives of those who teach and guide them.

The curriculum invites students and teachers to investigate a theme by examining it from many different perspectives—those of the traditional disciplines of knowledge as well as through lenses of organizing ideas. This regular practice of inquiry develops the habits of mind needed for life-long, self-directed learning.

Practical Considerations

How can this vision be translated into practice? There are many ways to integrate the curriculum. Teachers and administrators grapple with common questions as they develop their own patterns.

1. Introducing integrated curriculum

There are many ways to introduce integrated curriculum. The situation, educational philosophy, personnel, and, above all, the student needs make its development in every school unique.

Many middle schools begin by restructuring one or more grade levels into interdisciplinary teams. Occasionally the integrated curriculum is introduced in a "school-within-a-school" setting.

Teams provide ways for students to know each other, for manageable block scheduling, and for teachers to have common planning periods. It is possible to begin with one team, one grade level, several volunteer teams across the grade levels, or to make a schoolwide commitment to integrated curriculum.

Support from the central office is essential. Every new program should develop from a sound philosophy and from shared commitment to it among teachers and administrators.

Staff development is crucial. Integrated curriculum often requires teachers to change their approach to teaching and learning. This change may be difficult and even painful. The principal plays a vital part in ensuring that time and support are available.

2. Incorporating subject areas

Theme studies can develop from questions that arise in any subject area and then lead naturally to inquiry in other areas. For example, a theme study drawn from a piece of literature may lead to scientific, historical, mathematical, and artistic inquiries across the subject areas.

Some theme studies emphasize exploration in two or three subject areas but, even in these more focused studies, it is difficult to exclude any area of the curriculum. Students learn to examine any significant question or generalization through the eyes of the artist, the social scientist, the mathematician, the musician, the scientist, or the writer.

The content and skills required by the curriculum or contained in the textbook must be appropriately covered. A regular review by all team teachers can identify common topics, concepts, and questions for study that, through careful sequencing, can be addressed in integrated theme studies. As teachers and students become more familiar with the thematic approach, they see natural connections that build a more coherent curriculum and develop skills in real-life situations.

It is not always necessary, or even desirable, that theme

studies across the whole curriculum comprise the entire course of study. Often, a school or team will begin with one major theme study per semester or even per year, and gradually increase the number.

3. Selecting topics and themes

When beginning to implement integrated curriculum, teachers tend to focus on topics rather than themes. Topics are fairly narrow and limited to a particular time, place, or phenomenon.

Themes, on the other hand, are more universal in nature, spanning space and time. For example, "electricity" is more limited in scope than "energy"; the American Revolution is less universal than revolution.

Themes can emerge from several sources: concepts and generalizations identified in curriculum guides or textbooks; a work of literature or a collection of works of literature on a common theme; primary sources, experiments and investigations; and meaningful problems encountered in science, social studies, mathematics, and the literary and fine arts.

Perhaps the most meaningful learning experiences for young people are theme studies that arise from their own interests.

In integrated theme studies, the textbook is used as one of many resources rather than the main source of information and direction. When beginning integrated theme studies, teachers often prefer all students to work on the same types of assignments. As teachers and students learn to investigate a common theme through different fields of study, small groups or individual students may select questions of particular interest to explore in depth, and their studies become more individualized.

4. Adapting teaching practices

Integrated curriculum studies focus on learning rather than teaching. The teacher becomes a facilitator and guide rather than a lecturer or deliverer of information.

When beginning integrated theme studies, teachers may have to take a directive role in selecting themes, framing questions, establishing routines, locating resources, and assigning projects. As teachers and students become more familiar with the approach, they become less directive and move toward being a co-investigator with the students.

Some teachers have been using integrated approaches to teaching for years without using that name. Others easily develop the concept in their practice when given an organizing framework. These teachers often become facilitators of integrated curriculum in their schools and districts.

Such a role is easier for some teachers than others. Teaching styles vary, and teachers have a great deal invested in their own particular strengths and styles. Staff development, careful selection of team members, continued support, and respect for teacher autonomy are essential.

5. Scheduling a theme study

Theme studies may be as short as a week or as long as a year. Initially, teachers may prefer to limit the study to a fairly short period. Teachers may implement one theme study during the first year, then expand to two themes the next year.

As the approach becomes more familiar, more extended theme studies can be implemented, and several concurrent studies may be in progress, each at a different stage of development. These studies may be linked to a broad overarching theme, or may reflect several different student interests.

6. Assessing student learning

New approaches to teaching and learning demand new ways of assessment. Traditional assignments and tests may not be appropriate to assess the types of content and process learning that occur in integrated theme studies. Assessment must be ongoing and should be based more on students' actual work than on summative tests.

Portfolio assessment allows students to become aware of and demonstrate their own growth over time. Comprehensive individual or group projects can replace tests for summative evaluation. Cooperative learning allows students to progress at different rates while still making important contributions to the work of the group. Peer assessment can be a valuable learning tool for the assessor and the assessed. Parent conferences are valuable in helping parents to understand different approaches to evaluation, and to keep informed about the progress of their children.

The principle of assessment in integrated curriculum studies is the same as in any learning situation: identify the desired learning (content and process) and then develop appropriate means of determining the extent to which that learning has taken place.

7. Involving parents and the community

Integrated curriculum provides ways for parents and community personnel to get more involved in student learning. The community becomes a learning laboratory when school studies are organized around questions that can be answered by consulting the community's primary sources.

Local businesses can become active participants in education by providing monetary support for a field trip, allowing students to visit them, and sending visiting experts to school classrooms.

Parents can serve as important resources in areas varying from oral history to career exploration to hobbies and special interests.

The major key to success is information and involvement. The parents and the community need to know about changes in curriculum and in methods of teaching and learning, and their support and participation are criti-

cal to the success of any major change. They may receive this information through news and information services, letters home, the parent-teacher organization, and special programs.

8. Encountering problems

Inevitably, new challenges and new ventures open up new problems. One of the most common is the use of time. Teachers and principals alike have difficulty finding the time necessary for team planning, for locating and developing resources, for "covering" the required curriculum.

Scheduling can be an allied problem, though block scheduling, teaming, and computer programs are helpful here. Resources must be identified and cataloged. The central office must understand and support the program. Communities may need discussion of the principles and purposes of integrated curriculum.

Teachers may have difficulty adjusting to a new approach to teaching or working in teams. Team planning may uncover personality conflicts that must be resolved. Time, flexibility, support, and respect for teacher autonomy and expertise are essential.

Assessment and evaluation can be problems. New means of assessment are being developed in all subject areas and require new perspectives on evaluation designed to uncover student growth in thinking as well as mastery of content.

Benefits of an Integrated Curriculum

Integrated curriculum has shown important benefits for students and teachers.

Students become part of an interactive community; they know each other and become familiar with teachers. The team structure can provide consistency for students, and teachers can develop a broad and cohesive view of each student.

Seeing connections among different ideas and approaches is essential in the complex modern world. Integrated theme studies help students develop the ways of thinking that are used by scholars in every field of study. Students learn to work together to explore meaningful questions and ideas.

Some students may actually investigate questions for which there are no established answers, thereby pushing against the frontiers of knowledge. All students can develop confidence in their ability to be self-directed learners. This is the meaning of *AMERICA 2000's* strategy of developing a nation of students.

Teachers are able to overcome some of the typical isolation of their work. They share ideas and develop new ones as they interact regularly with each other. They learn new teaching approaches and are able to use their own strengths in a variety of ways. They come to appreciate their students as co-inquirers and fellow learners. They support each other, share resources, and help each other to explore the community.

As parents participate in their children's studies, they become partners in learning in new and meaningful ways. They develop greater understanding of the curriculum and trust in the schools. Students begin to value their parents as sources of knowledge.

The school itself benefits as it becomes more of a community. The examination of broad and significant themes helps students and teachers alike to develop new visions of learning that cross boundaries within the school and between the school and the community.

Interdisciplinary studies are developing in all kinds of ways across the United States and Canada. A few examples are described below.

Exempli Gratia

CENTRAL MIDDLE SCHOOL
9 Indian Rock Lane, Greenwich, Conn. 06830
Contact: N. James Bulger, principal
(203) 661-8500

Now in its third year of reorganization from a junior high to middle school, this school is committed to learning across the curriculum and to enabling students to see connections across the content areas.

The sixth, seventh, and eighth grade teams are developing and refining studies related to overarching themes appropriate to the grade levels: "Change" as a theme for sixth graders, "Interdependence" in seventh grade, and "Prejudice and Tolerance" in eighth grade.

The themes are approached in several different ways during the year. Beginning the previous summer, the required summer reading lists reflect the theme for the year. During the year, the grade level theme may incorporate two subject areas, such as social studies and language arts, or science and math, and at other times include the four major academic areas.

There is a concurrent "hothouse" variety of connections, where team teachers work intensively together to meet the perceived needs of students in the team. Common to all these interdisciplinary units is the use of local resources that are developed into concrete learning experiences for middle school students.

ALGONQUIN JUNIOR HIGH SCHOOL
Des Plaines Community Consolidated
School District 62
767 Algonquin Rd., Des Plaines, Ill. 60016
Contact: Raymond Gunn, principal
(708) 824-1129

An interdisciplinary approach to education has been developing since 1967, with the commitment of the district and school board.

The program represents a varied and flexible organizational and instructional approach. More specifically, the

program is student-centered, includes many opportunities for interdisciplinary collaboration, allows for varied grouping and scheduling, assists in meeting the needs of "at-risk" students, and offers an exploratory approach in "special" subject areas.

Teachers of grades 7 and 8 collaborate as interdisciplinary teams to design, implement, and evaluate thematic studies. Each academic team is expected to meet daily. Generally, teams rotate responsibilities for chairing, recording, and scheduling. The school principal helps evaluate the needs of each team, helps optimize their special qualities, and provides guidance to make them more effective.

Teams generally develop at least two to three thematic units per year, selected from the general curriculum. Algonquin teaching teams are currently exploring the concept of threading skills and thinking processes through the various curriculum areas. For instance, a "thread" on "cause-effect" or "analysis" might be the focus of work in all subject areas from several weeks to a full quarter.

SCHOOL DISTRICT 4J, EUGENE PUBLIC SCHOOLS
200 North Monroe St., Eugene, Oreg. 97402
Contacts: Betty Jean Shoemaker, K-8 curriculum coordinator; William Kentta, K-8 curriculum coordinator; Kay Mehas, 9-12 curriculum coordinator; Jerry Colonna, director of secondary education.
(503) 687-3123

In 1989, a task force of teachers, administrators, parents, and business people developed the Education 2000 Integrated Curriculum that is currently being implemented in Eugene's 34 elementary programs. It is a concepts-based thematic model of integration with six major conceptual themes (Communities, Change, Power, Interactions, Form and Systems) and 68 related concepts. Each of the themes is explored through different lenses of curriculum strands that include: The Individual, Human Societies, and The Earth and The Universe. In addition, the curriculum emphasizes strategic processes, authentic assessment, and is framed through the use of questions.

Middle schools are building on the elementary model, while secondary schools are exploring divisional rather than departmental structures to offer several concept-based interdisciplinary courses for students.

Each Eugene school program develops its own approaches to curriculum integration in ways that encourage site-based decision making. Programs are designed to reflect the unique image and character of its neighborhood.

In Eugene, change is a process, not just a product. Successful implementation of integrative education requires attitudinal and procedural change as much as substantive changes in content.

OAKLEA MIDDLE SCHOOL
1515 Rose St., Junction City, Oreg. 97448
Contacts: Lowell Pearce, principal; Jim Wasson, vice principal; and Wally Cassel, science curriculum representative
(503) 998-3381

Oaklea Middle School has a media center at its hub from which classroom clusters called *rivers* radiate. Each river is a school-within-a-school for multiage groups of students in grades 5-8. Interdisciplinary teaching teams within each river develop integrated curricula.

All teams within each river have common planning periods and hold regular meetings after school. Each river sends curriculum and scheduling representatives to meetings of the four schools.

Students are assigned to a river first by parent choice, and then, according to recommendations from their elementary teachers. Attempts are made to balance each river with students who have different levels of achievement and differing needs. Students in each river stay with their homeroom teacher for four years.

Oaklea's teachers teach three–six subjects per day. All curriculum is proposed by teachers, individuals, and groups. The faculty seeks to implement the best research-based practices and because of the organization for effective decision making and communication, is able to do so with ease and speed.

The school, recognized in Oregon and nationwide as a model school, recently obtained federal funds to enhance its work with "at-risk" students and to develop the interdisciplinary concept. Monitoring, assessment alternatives, and integrated curriculum are the focus of Oaklea's new efforts.

SAN ANTONIO INDEPENDENT SCHOOL DISTRICT
1811 S. Laredo St., San Antonio, Tex. 78207
Contacts: Caroyl Green, director of secondary curriculum (512) 227-2591; Edward Tobia, director of elementary curriculum (512) 227-4096; and Amy Jo Baker, secondary social studies supervisor
(512) 227-2591

San Antonio Independent School District prepares its elementary and middle school teachers to design integrated thematic units. Sixteen elementary facilitators were trained in spring 1991 to develop curriculum for implementation in the summer 1991 program for Chapter 1 students. Each facilitator was responsible for training 15 colleagues in the development of an integrated unit and assisting them with the implementation of that unit.

Three teachers per grade level developed and implemented thematic studies at 16 summer school sites.

The middle school program was also developed for Chapter 1 summer school academies. Middle school teachers who enrolled in a graduate course at the Uni-

versity of Texas at San Antonio were responsible for crafting thematic interdisciplinary studies to disseminate to other teachers and to implement during the summer academies.

In both elementary and middle school academies, community resources became primary sources for data gathering, as students inquired about their themes. Alternative assessments included journals, portfolios, performance tasks, student products, and teacher checklists at the elementary and middle school levels.

All theme studies during the summer academies included the exhibit of student work during a fair for teachers, students, and parents.

The integrated theme studies developed for and during the summer academies are being integrated into the regular year's academic programs.

ANSON JONES MIDDLE SCHOOL
Northside Independent School District
1256 Pinn Rd., San Antonio, Tex. 78227
Contact: Charles Burling, principal
(512) 678-2100.

This schoolwide implementation of team organization and interdisciplinary curriculum is in its fourth year. Classrooms are grouped so teachers can work closely together, and movement in the halls is minimized. Bells during the day have been eliminated, and flexible scheduling allows teams to block their classes in different ways.

Curriculum integration is planned carefully by teachers at the daily team meetings. Interdisciplinary teams of teachers at each grade level interface on various levels to provide integrated learning experiences for their students. Every team develops at least one integrated theme unit each semester which incorporates some or all of the content areas.

ROGERS MIDDLE SCHOOL
San Antonio Independent School District
314 Galway, San Antonio, Tex. 78223
Contact: Sandra Scheideman, principal
(512) 333-7551

Rogers Middle School serves primarily lower socioeconomic minority students in grades 6, 7, and 8. A faculty committee elected to develop an interdisciplinary team organization in 1990, when grade level teams were formed and scheduling for team planning was arranged.

Following a staff development workshop for the entire faculty on integrative curriculum development, teams met once a month with the principal and faculty members from the University of Texas at San Antonio. Once a theme was underway, the meetings explored issues of its implementation. Sometimes a theme study led to new explorations; sometimes when the theme study was completed, the team resumed its standard curriculum.

During the 1991-92 academic year, with newly constituted teams, efforts are being made to build on the preceding year's efforts. Several themes developed in 1990-91 will be repeated, and new themes will be developed according to teacher and student interests.

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KUDOS

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